

WHAT IS CLAIMED IS:

1. An imaging device comprising:

an image pickup element configured to simultaneously pick up images in plural visual field directions;

5 an image pickup lens arranged on a front face of the image pickup element; and

a first optical element arranged on a front face of the image pickup lens and having a concave lens property,

wherein the first optical element guides lights from 10 wide angle ranges in partial visual field directions among the plural visual field directions onto the image pickup element via the image pickup lens.

2. The imaging device as claimed in claim 1 further comprising a second optical element arranged on the front 15 face of the image pickup lens and having no concave lens property,

wherein the second optical element guides lights from non-wide angle ranges in the remaining visual field directions among the plural visual field directions onto 20 the image pickup element via the image pickup lens.

3. The imaging device as claimed in claim 2, wherein the first optical element is arranged within lower area of a vertical view angle of the image pickup lens and guides light from the visual field direction of a forward slanting 25 lower direction to the imaging device onto the image pickup

element via the image pickup lens, and

wherein the second optical element is arranged within  
upper area of the vertical view angle of the image pickup  
lens and guides lights from the visual field directions  
5 of both left side and right side directions of the imaging  
device onto the image pickup element via the image pickup  
lens.

4. The imaging device as claimed in claim 2, wherein the  
second optical element comprises a pair of left and right  
10 prisms each having a triangle pole shape, and

wherein each of the left and right prisms guides the  
incident light from the respective visual field directions  
incident from a side face arranged on the visual field  
direction side onto the image pickup element via the image  
15 pickup lens after reflecting the incident light twice on  
inner prism faces thereof.

5. The imaging device as claimed in claim 2, wherein the  
second optical element is formed as a single prism having  
a triangle pole shape.

20 6. The imaging device as claimed in claim 2, wherein the  
first optical element is formed integrally with the second  
optical element.

7. The imaging device as claimed in claim 1 further  
comprising an assembly member configured to assemble the  
25 first optical element with the image pickup lens.

8. The imaging device as claimed in claim 1 further comprising a case having light shielding property and having a transparent portion configured to take in the lights from the plural visual field directions.

5 9. The imaging device as claimed in claim 8, wherein the first optical element is formed integrally with the case.

10. The imaging device as claimed in claim 8, wherein the transparent portion comprises a transparent member attached to the case.

10 11. The imaging device as claimed in claim 8, wherein the transparent portion comprises an opening formed on the case.

12. The imaging device as claimed in claim 8, wherein the case is formed of a transparent material and comprises a  
15 light shielding portion in which coated with a light shielding member having light shielding property.

13. The imaging device as claimed in claim 8, wherein a hard coating processing is performed on at least the transparent portion of the case.

20 14. The imaging device as claimed in claim 8, wherein the transparent portion comprises the first optical element.

15. The imaging device as claimed in claim 2, wherein the imaging device is disposed at a front portion or at a rear portion of a vehicle, and

25 wherein the imaging device is configured to

simultaneously pick up image of dead areas in three directions of both left side and right side directions and forward or backward direction of the vehicle.

16. A vehicle circumference visualizing apparatus  
5 comprising:

an imaging device disposed at a front portion or at a rear portion of a vehicle;

an image processing section configured to perform predetermined image processing with respect to an image  
10 picked up by the imaging device; and

a display device arranged within the vehicle and displaying the image processed by the image processing section,

wherein the imaging device comprises:

15 an image pickup element configured to simultaneously pick up images in plural visual field directions;

an image pickup lens arranged on a front face of the image pickup element; and

20 a first optical element arranged on a front face of the image pickup lens and having a concave lens property,

wherein the first optical element guides lights from wide angle ranges in partial visual field directions among the plural visual field directions onto the image pickup element via the image pickup lens.

25 17. The vehicle circumference visualizing apparatus as

claimed in claim 16, wherein the imaging device further comprises a second optical element arranged on the front face of the image pickup lens and having no concave lens property, and

5       wherein the second optical element guides lights from non-wide angle ranges in the remaining visual field directions among the plural visual field directions onto the image pickup element via the image pickup lens.

18.     The vehicle circumference visualizing apparatus as  
10 claimed in claim 16, wherein the image processing section performs at least one of the processings of cutting-out, enlarging, rearranging and image combining of the pickup image in each direction.

19.     The vehicle circumference visualizing apparatus as  
15 claimed in claim 16, wherein the image processing section performs combining a vehicle navigation image to the image pick up by the imaging device.